

We Claim:

1. An apparatus for cooling a plurality of assemblies, comprising:
an enclosure configured to form a plurality of tiers stacked in a longitudinal
5 dimension, the plurality of tiers including a first tier;
wherein each tier of the plurality of tiers has opposite first and second
longitudinal ends with respect to the longitudinal dimension;
wherein each tier is configured to support one or more assemblies of the
plurality of assemblies; and
10 wherein the enclosure defines a distribution plenum contiguous to the first
longitudinal end of the first tier, the distribution plenum being configured to distribute
received coolant through the first longitudinal end of the first tier.
2. The apparatus of claim 1, wherein the enclosure further defines an exhaust
15 plenum contiguous to the second longitudinal end of the first tier, the exhaust plenum
being configured to channel away coolant received from the second longitudinal end
of the first tier.
3. The apparatus of claim 2, and further comprising a pump configured to pump
20 coolant such that it passes sequentially through the distribution plenum, the tier, and
the exhaust plenum.
4. The apparatus of claim 2, and further comprising a pump configured to raise the
25 pressure within the distribution plenum with respect to the pressure within the exhaust
plenum.
5. The apparatus of claim 2, wherein the enclosure is configured such that coolant
supplied to the distribution plenum is received laterally into the enclosure with respect
to the longitudinal dimension, and such that coolant received by the exhaust plenum is
30 channeled laterally out of the enclosure with respect to the longitudinal dimension.

6. The apparatus of claim 1, wherein the enclosure is configured such that coolant supplied to the distribution plenum is received laterally into the enclosure.

5 7. The apparatus of claim 1, wherein the enclosure further defines a separate distribution plenum for each tier, each distribution plenum being contiguous to the first longitudinal end of its respective tier, and being configured to distribute received coolant through the first longitudinal end of its respective tier.

10 8. The apparatus of claim 7, wherein the enclosure is configured such that coolant supplied to each distribution plenum is drawn laterally into the enclosure, with respect to the longitudinal dimension, at a level-side location longitudinally adjacent the distribution plenum.

15 9. The apparatus of claim 7, wherein the enclosure further defines a separate exhaust plenum for each tier, each exhaust plenum being contiguous to the second longitudinal end of its respective tier, and being configured to channel away coolant received from the second longitudinal end of its respective tier.

20 10. The apparatus of claim 9, wherein the enclosure is configured such that coolant received by the exhaust plenum is channeled laterally out of the enclosure, with respect to the longitudinal dimension, at a level-side location longitudinally aligned with the exhaust plenum.

25 11. The apparatus of claim 9, wherein the enclosure is configured such that coolant supplied to each distribution plenum is drawn laterally into the enclosure, with respect to the longitudinal dimension, at a level-side location longitudinally adjacent the distribution plenum, and such that coolant received by the exhaust plenum is channeled laterally out of the enclosure, with respect to the longitudinal dimension, at a level-side
30 location longitudinally aligned with the exhaust plenum.

12. The apparatus of claim 1, wherein the one or more assemblies that the first tier is configured to support comprise a plurality of planar cards stacked laterally, with respect to the longitudinal dimension, across the first tier.

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13. The apparatus of claim 1, wherein the distribution plenum includes a wall defining a boundary between the distribution plenum and the first longitudinal end of the first tier, the wall including a plurality of orifices configured to direct coolant received by the distribution plenum through the first tier at selected locations.

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14. The apparatus of claim 13, wherein the plurality of orifices are configured as jets.

15. The apparatus of claim 14, wherein the jets direct streams of coolant toward the plurality of assemblies.

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16. The apparatus of claim 14, wherein the jets are configured as slots that emit streams forming sheets of coolant.

17. The apparatus of claim 14, wherein the jets emit coolant at a velocity of at least 4 m/s.

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18. The apparatus of claim 14, wherein the jets emit coolant at a velocity of at least 6 m/s.

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19. The apparatus of claim 14, wherein the jets emit coolant at a velocity of at least 6 m/s and no more than 8 m/s.

20. An method of cooling a plurality of assemblies, comprising:

distributing coolant through a longitudinal end of a first tier of a plurality of tiers within an enclosure, the enclosure defining a distribution plenum contiguous to the first longitudinal end of the first tier;

5 wherein each tier of the plurality of tiers is configured to support one or more assemblies of the plurality of assemblies.

21. The method of claim 20, and further comprising:

10 distributing coolant through a longitudinal end of a second tier of the plurality of tiers, the enclosure defining a distribution plenum contiguous to the longitudinal end of the second tier.

22. An means for cooling a plurality of assemblies, comprising:

15 a means for distributing coolant through a longitudinal end of a first tier of a plurality of tiers within an enclosure, the enclosure defining a distribution plenum contiguous to the first longitudinal end of the first tier;

wherein each tier of the plurality of tiers is configured to support one or more assemblies of the plurality of assemblies.

20 23. The means for cooling of claim 22, and further comprising:

a means for distributing coolant through a longitudinal end of a second tier of the plurality of tiers, the enclosure defining a distribution plenum contiguous to the longitudinal end of the second tier.